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PROGRESS

The National Tool and Die Journal

JULY
1940

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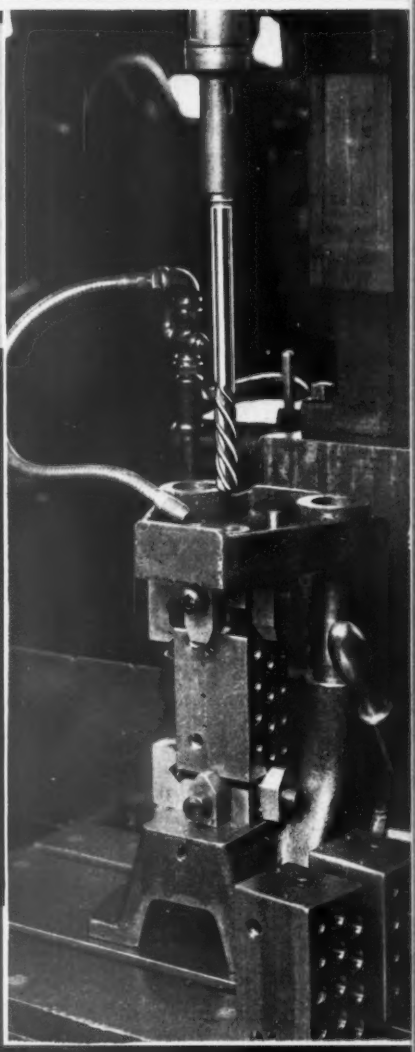

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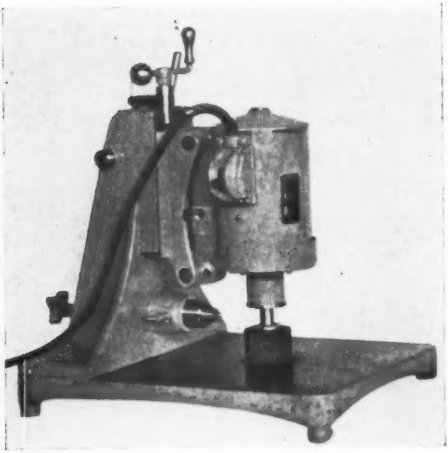

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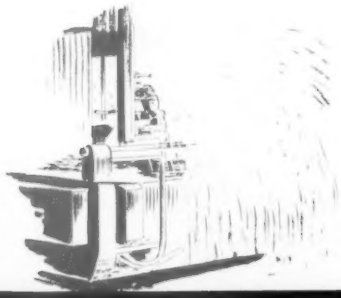

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The National Tool and Die Journal

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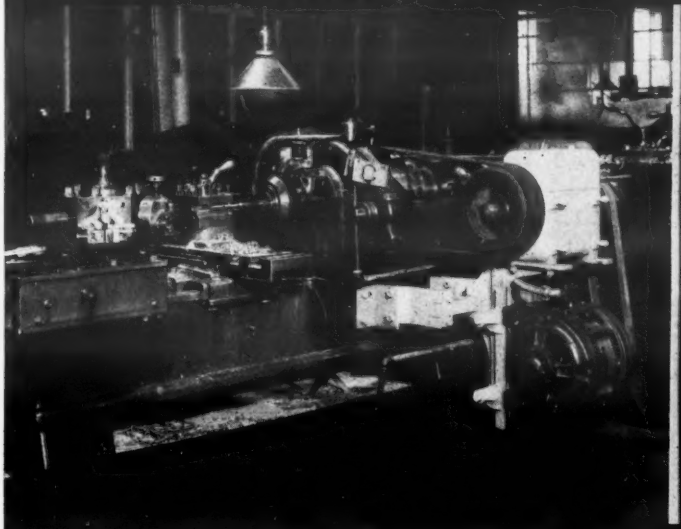

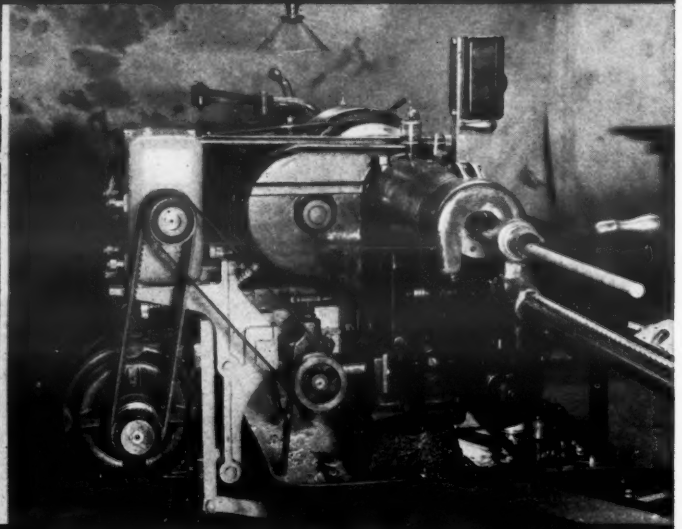

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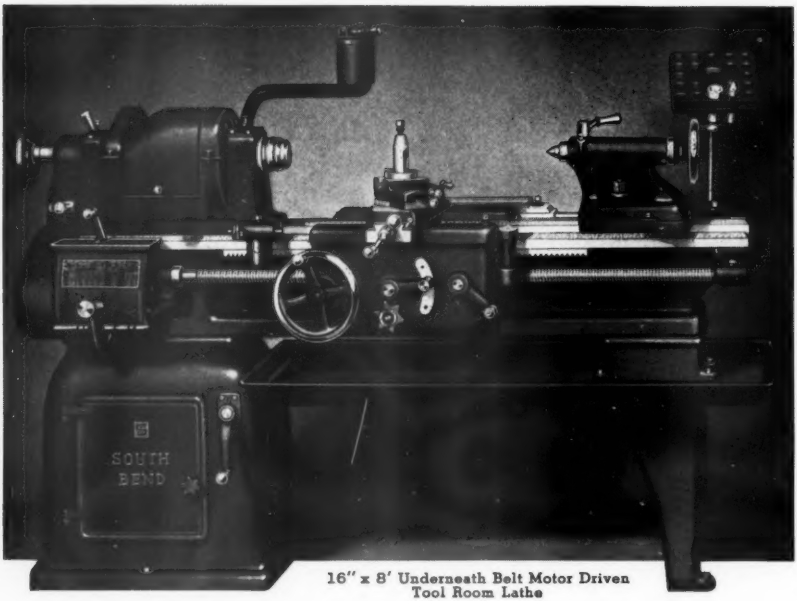

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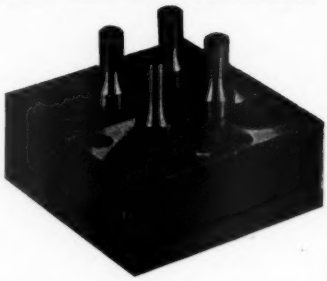

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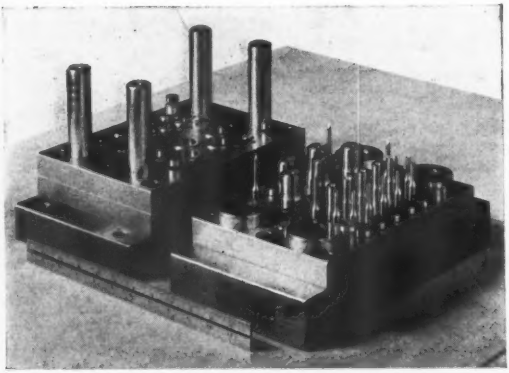

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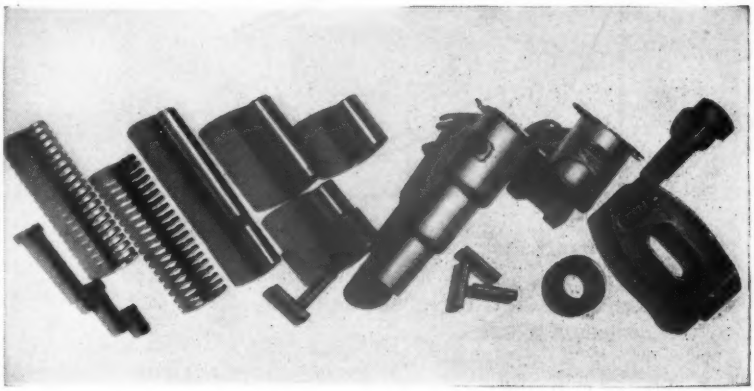

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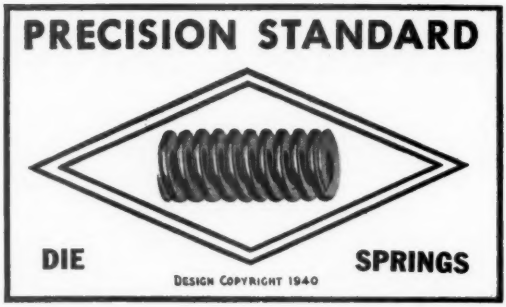

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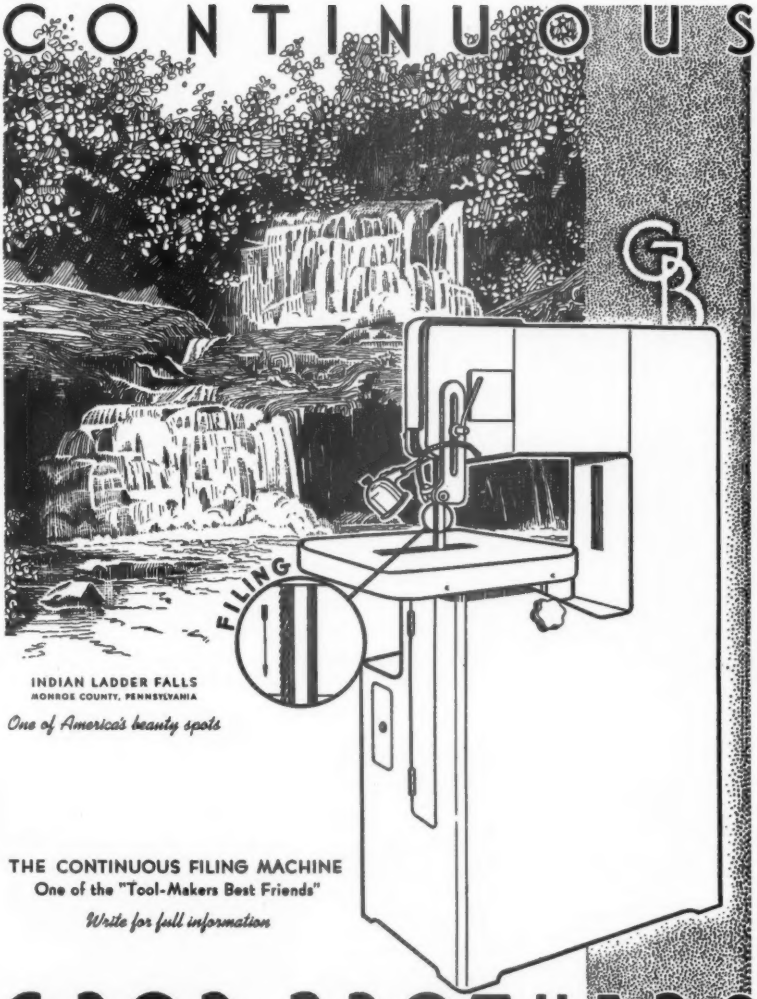

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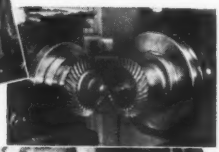
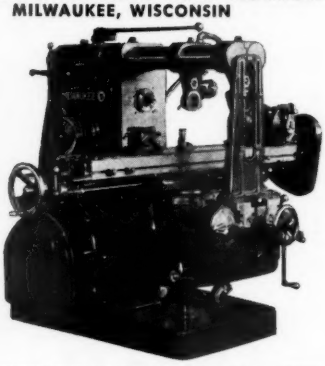


Gear laboratories and three of many precision tests in the production of gears for Milwaukee Milling Machines.



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TOOL · DIE · MACHINE PROGRESS

The National Tool and Die Journal

JULY, 1940 Vol. 6, No. 4

We Need Trained Men!

DURING the past ten years comparatively few young men have received the thorough training in those trades commonly spoken of as tool making and die making to qualify them today as "first class" skilled workers. Regardless of the reasons for this situation, both the Federal Government and Industry recognize the seriousness of an inadequately skilled manpower in the nation's Tool and Die Shops and in the Tool Rooms and Die Departments of Production Plants.

Educational and training programs intended to develop specific skills as quickly as possible have been proposed, and in some instances should be quite successful. There are production machines in the high production industries and simpler machines in the tool room and die shop that can be operated successfully with a few weeks or months of training. But these machines, even the simplest single-purpose machines, must be "set up." To do a perfect job, this requires the attention of a skilled, broadly trained man. The maintenance of the small tools which the machines use requires an understanding of mathematical precision and a considerable period of experience.

The making of the dies and molds, tools and gages, jigs and fixtures, and the thousands of other precision accessories which are required for mass production, is an altogether different matter. Tool makers and die makers are not made in six months—in fact six years of well organized education, training and experience are much nearer the time required for such a workman to acquire the proficiency which enables him to project the third dimension into a drawing, lay out and machine the parts it calls for and assemble them into a perfect tool or die.

In the tool rooms and die shops, thousands of men already have made considerable progress in their trades. Many of these men attend night schools or study at home to advance themselves in mathematics, mechanical drawing and theory of design. Ordinarily these younger mechanics do not have trade journal articles written especially for them, even though their need for instruction may be much greater. Publishers generally address their editorial content to officials and to shop men who have authority to buy the products of their advertisers.

Our situation, because of the nature of many tool rooms and die shops, seems to be somewhat different. Our mail continually brings us the encouraging information that our monthly issues are sent into the shop after being read by the original recipients. We have personally verified this many times.

We are happy, therefore, to announce a new series of articles on "Tool Design and Tool Making" by E. G. Marshall, assistant superintendent of the Prebble Plant of the Pittsburgh Screw and Bolt Corporation—a series written especially for the younger shop men by the author of "Practical Die Design and Die Making." A tool shop master mechanic who has seen the series told us that not only the younger men but chief engineers, master mechanics and superintendents would welcome these articles, not alone for their timeliness but because younger shop men are continually in need of and seek such material.

George J. Huebner, Editor.

Methods for Accurate Locating of Work

By E. G. Marshall
Assistant Superintendent
Pittsburgh Screw and Bolt Corp.
Prebble Avenue Plant

This is the first of a series of articles on the general subject of Practical Tool Design and Tool Making written especially for the younger, ambitious and forward-looking men in the tool rooms and die shops. Mr. Marshall, who had to learn his trade the "hard way," has written this series out of a conviction that these articles will be useful to the apprentice or the young beginner in the shop who may not plan to complete an apprenticeship. The material is clear, concise and the initial article is representative of the practical nature of the entire series. Many suggestions and methods given will be of interest to shop men of experience.

THE decision as to how to locate a part or product most effectively depends largely upon its shape, whether it is flat steel, a casting or bar stock, and also whether it is rough or machined. The accompanying drawings illustrate several of the more generally used locating methods.

For a flat part, the nest plate A, shown in Fig. 1, is recommended. This plate A is used in dies as well as drill jigs. It is usually made of cold rolled steel and cyanide hardened. It is attached to the jig with screws and dowels. The groove is used as a pick-out groove, being milled partly in the nest plate and partly in the jig under the work. Due to the design of this plate the work being located cannot vary in size, and for this reason it functions well with blanked parts. To avoid too expensive fitting between the plate and the work, the plate can be relieved wherever a close fit is not necessary.

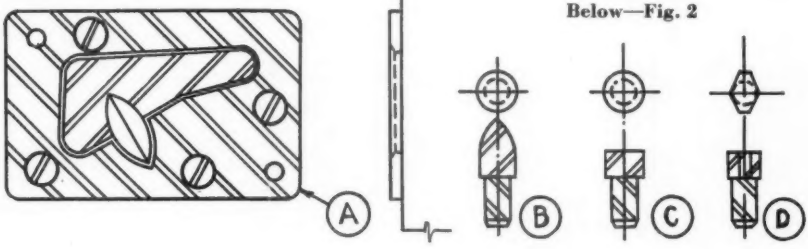
In many cases, the jig which is being designed is a second operation jig, holes having been drilled in a previous operation. Where two of these holes are to be used for locating, the bullet nosed pin B, Fig. 2, is effective. The usual practice is to make the diameter of the pin .0002″ under the minimum limit of the hole in which it operates. For this reason, blueprint limits on holes being used for locating should be small, probably plus or minus .0005″ if practical.

When the shape of the part or work piece is such that it can be placed over the locating pins in more than one way, it is necessary to insure its placement in the correct position only. The pin C, Fig. 2, is the type generally used, its large head preventing the work from going down over the locating pins in any except the correct position.

Another difficulty sometimes encountered when these locating pins are used, is that the center distance varies, perhaps enough to prevent the work from fitting over the pins. To overcome this difficulty the pin D, Fig. 2, is used in one of the holes. Select the hole that will give the greatest accuracy and use the full size pin in it. Then use the

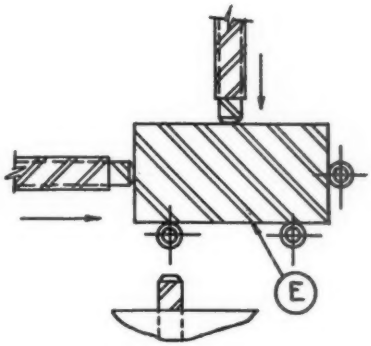
relieved pin D in the other hole. Make sure that the full size part of the pin is at right angle to the center line between the two pins.

E, Fig. 3, shows three hardened and ground dowel pins being used to locate the work. The two locating pins shown on the same side should be on that side



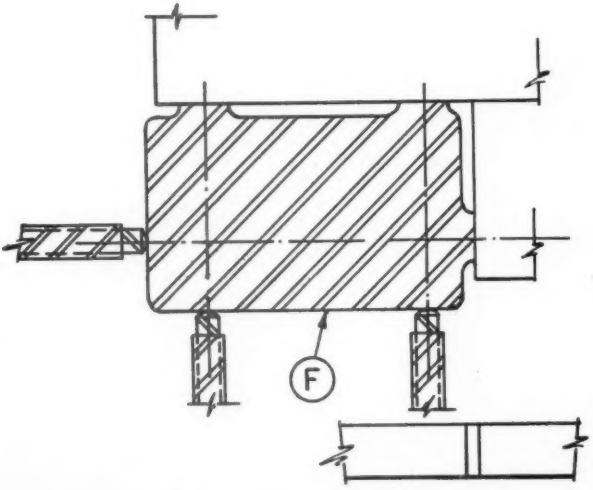
Left—Fig. 1

Below—Fig. 2



which must be the most accurate in relation to the drill holes, and they should be as far apart as possible. Also, the clamping screws should be placed to exert their greatest force between the locating pins. If the clamping force, ordinarily a screw, is not between the pins, the work will locate against only one pin. This screw, which clamps against the two pins, always should be tightened first. On the end where only one pin is used, the pressure should be along the same center line as that of the locating pin. It is undesirable to use more than three pins because the addi-

Above—Fig. 3



Right—Fig. 4

tional pins may affect the accuracy. The clamping post usually is a cold rolled steel post with a thumb screw.

F, Fig. 4, is a similar type excepting that a flat plate is screwed and doweled to the base. This is a tool steel plate and it should be hardened but it need be ground only on the bottom where it is attached to the base and on the faces that locate the part. As shown, the centerline of the clamping screws should contact the center of the locating faces. To be off this center would move the part out of line. Tighten the screws against the two locating faces first.

G, Fig. 5, is a compound type locator. The base of the casting rests on the flat plate, H. This plate and the plate I are made of tool steel and are hardened and ground. Clamp screws hold the work against the plates I and H, thus locating the casting in two directions. The location in the third direction is obtained by the pin J, the locating end of which is flattened so it cannot locate the work in its distance from H but can operate only in the direction parallel with H. The flattened end eliminates the necessity for extreme accuracy from the bottom face to the pin hole. The pin has a bearing fit in the block K.

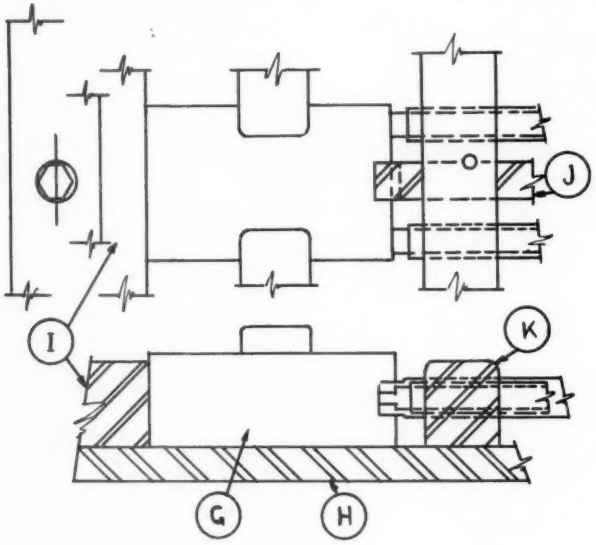


Fig. 5

The block L, Fig. 6, has a Vee face with a reverse angle or undercut to-

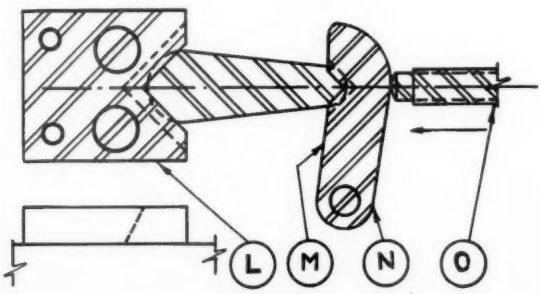


Fig. 6

wards the base (see detail elevation, Fig. 6). This centers the outer radius of the work and the undercut holds the work down against the base plate. The swinging arm M centers the end of the work gears from their teeth or for locating indexing fixtures. The locator slide R moves between the guides P, which are mounted on a flat plate, all parts being made of tool steel and hardened and

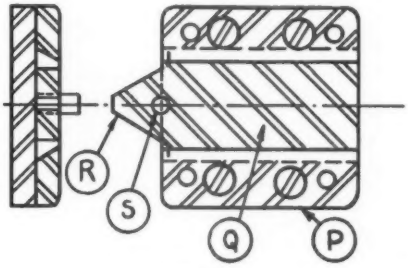


Fig. 7

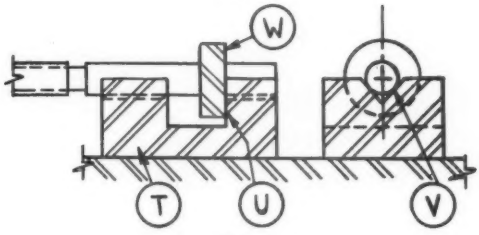


Fig. 8

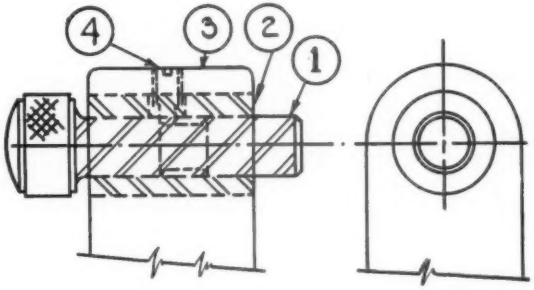


Fig. 9

for the small hole and, like block L, also holds the work down. M has to be a close fit on the screw N, to prevent the locating end from rising. The screw O moves the arm M toward and away from the work being located. When desired, a wearing block can be used above the end of the locator M to prevent it from rising.

Q, Fig. 7, shows a method for locating ground. The whole assembly is doweled to the main base. The working faces R are ground, each face is an equal distance from the center pin S. For use on standard involute gears the included angle of both faces R should be 29 degrees. To maintain the center line in the same position each of the faces R should be ground the same amount.

(Continued on Page 41)

PLASTIC MOLD DESIGNING

By GORDON B. THAYER

Plastic Design Engineer
General Industries Company

Article V of a Series

Mr. Thayer describes the general types of compression molds and gives examples of each. The series will continue next month with the first of several designs of injection type molds.

Both Mr. Thayer and the Editor wish to thank readers who have written in for more design information or who have suggested alternate designs. Mr. Thayer is particularly interested in the suggestions on alternate designs. These will be classified and, if permission is given, be used in the text which will be published at the end of this series.

—The Editor.

Types of Molds for Compression Molding

THE function of a compression mold is to apply heat and pressure, simultaneously, to the molding material, and to hold the material under pressure until it is cured, or set in the shape of the mold. Molds which will perform this function may be classified, according to their operation, into three types. These mold types are designated as (1) positive, or full positive; (2) semi-positive, or landed positive and (3) flash, or overflow molds.

Selection of mold type is governed by necessity of design, or by economy of fabrication. In a positive mold, the material is under full mold pressure at all times. In a semi-positive mold, the material is subjected to slow uniform pressure that reaches full pressure only as the mold closes. In a flash mold, the pressure is built up by the resistance of the material itself as it flows over the land at the parting line. As the designs of the types shown indicate, positive and semi-positive molds cost more to build than flash molds.

Positive Type Mold

A positive type mold is shown in Fig. 7. It fully confines the material, and the full mold pressure is exerted at all times. The travel of the force is limited by the amount of material in the charge. No lands or stops are used. For a single mold, thickness and density of the casting are subject to variation unless the charges are accurately weighed and kept exactly uniform. In a multiple cavity positive mold, it is difficult to make the volume of each cavity uniform, and since this requires different amounts of material for the individual cavities, uniform castings are difficult to obtain. For this reason multiple cavity positive molds are seldom recommended.

The contour of the force follows closely the contour of the cavity. The clearance is shown at detail 1, Fig. 7. In the diagram, the clearance is exaggerated.

In practice, it is .002 to .005 inch. The clearance space, called the vertical flash ring, fills with material as flowing takes place. This material seals the mold, and forms a ring of flash, which is as thick as the clearance. In this manner, the flash thickness may be held to a minimum, if the fit between force and cavity is correct. This facilitates the edging operation for removing the fin of flash. If the clearance is too great, material will flow through and out of the mold, and the effective molding pressure will be reduced. The sealing action depends upon rapid "freezing" of the thin flash ring. Large clearance delays the freezing because of increased cross section. If the clearance is too small, excessive scoring of force and cavity will take place, and the casting will be damaged when pushed out of the mold, past the score marks.

The depth of the mold cavity in Fig. 7 is shown about 4 times the finished height of the casting. This is in order to make room for molding material which in powdered form has an average bulk factor of about 4 to 1. The depth may be less if preformed or tableted material

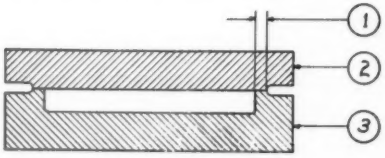


Fig. 7. Positive Type Mold

1 Clearance, or vertical flash ring
2 Force
3 Cavity block

is used, in which case the bulk factor is approximately 2 to 1.

Since there is no land in a fully positive mold, it is necessary to make certain the force of the press is not great enough to cause crushing of the mold parts. Parallels may be used between the force and cavity plates to provide extra bearing area, and to limit the closed height of the mold, but if this is done, the mold is made equivalent to a landed positive type.

For deep draw, thin wall sections, a positive type mold is desirable, because it maintains pressure on the material as it flows up the narrow opening to form the wall. Castings fill out well.

Semi-Positive Type Mold

Because of the difficulty of fitting positive molds, and because scoring is detrimental to the finish of the casting, a semi-positive mold is a good compromise design. Fig. 8 is a diagram of a semi-positive type mold. The telescoping portion (detail 6) is short, and its clearance (detail 1) is the same as for a full positive mold. An auxiliary telescoping portion (detail 4) provides a guide to prevent scoring of the mold proper, a larger space for material, and a land area to absorb excess pressure, and to limit the thickness of the casting.

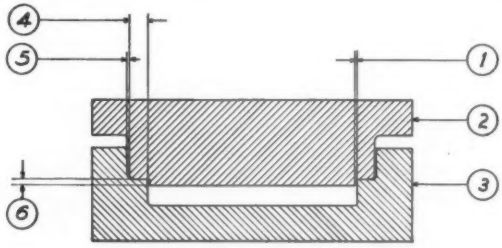


Fig. 8. Semi-Positive Type Mold

1 Clearance for positive
2 Force
3 Cavity block
4 Land width
5 Material well clearance
6 Positive portion

The positive portion (detail 6) of a semi-positive mold provides full pressure just as the mold closes. The material well is greater in area than the mold

proper, and cavity depth can be less than in a full positive mold, and still provide enough volume to take care of the bulk factor. A more shallow cavity is preferable, too, when inserts must be placed in the bottom of the mold. The decrease in height results in better heating when the mold is heated between hot plates. Scoring on the positive portion is limited to a very short section, and it is largely prevented by the auxiliary telescoping of the force in the material well. It is possible to have a generous radius on the well portion to facilitate guiding, and to have a sharp edge at the top of the cavity. A semi-positive mold provides the same control of flash thickness as does the positive type mold.

In a semi-positive mold, the material charge is not as completely trapped as in a full positive mold. A slight excess may be used, which is allowed to escape. Weighing need not be as accurate as in the full positive mold. This is an advantage because powder charges can be weighed more quickly, and preforming machines do not have to be watched as closely.

Flash Type Mold

Fig. 9 is a diagram of a flash type, or overflow mold. There is no way to provide extra space for bulk factor, and the charge is heaped in the cavity. This means more material can escape than in the two previously described molds. This type of mold is not suitable for deep draw castings, because the pressure exerted is not sufficient to make the material flow very far. The back pressure is built up by the flowing material along the land (detail 1) at the parting line. As the mold closes, the flash ring becomes thinner, and the flash freezes. Flash thickness can vary from .005 to .020 inch or more, depending upon the mold pressure and rate of cure. A fast-curing material will freeze quickly, and form a thick flash ring before the mold can close. This means that neither flash thickness nor casting thickness can be controlled accurately. Edging is liable to be difficult because of the thick flash. The width of land is important in the design. Wide lands increase the area of flash, and the pressure required to close the mold. In most cases narrow lands will not provide enough molding pressure.

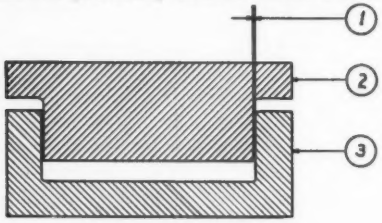


Fig. 9. Flash Type Mold

1 Land width or flash ridge
2 Force
3 Cavity block

A flash type mold is satisfactory for short runs or small quantity requirements. Experimental molds may be made of this type economically. Multiple sub-cavity molds are sometimes made flash-type. Such molds have a common loading chamber, with multiple cavities extending from it. Preformed or powder material may be used.

Probably the most common mold type used is the semi-positive type. Its advantages compared with other types have already been pointed out. There are several modifications of the elementary semi-positive type mold. These have been developed for special conditions, some of which will be pointed out in future descriptions as they occur.

ACKNOWLEDGMENT

Professor O. W. Boston, Chairman of the Department of Metal Processing, College of Engineering, University of Michigan, writes us calling attention to the fact that the "Glossary of Plastic Mold Designing" (June issue, page 20) should more properly be called "Nomenclature of Plastic Mold Design". Writing as the Chairman of the American Standards Association's Technical Committee 17 on Nomenclature of the Sectional Committee B5 on the Standardization of Small Tools and Machine Tool Elements, Professor Boston states that while there is very little difference in meaning between "glossary" and "nomenclature", the latter has been accepted by the Committee and approved by A. S. A. We appreciate the correction and will use the term "nomenclature" when adding to the June list, as we expect to do in subsequent issues.

George Gorton Co. Issues New Catalog On Pantograph Engraving Machines

A NEW catalog "Pantograph Engraving Machines" (form 1580) has just been issued by the George Gorton Machine Co., listing the entire line of standard 2-dimensional and 3-dimensional machines, special purpose machines and attachments. The company lists six advantages of the Gorton Pantograph Machines: (1) Accurate reproduction; (2) easier, faster operation; (3) uniform tracer pressure; (4) larger work capacity, since any length of work can be held on these machines; (5) work always in plain view; and (6) heavy, rigid construction.

The Gorton 2-dimensional Pantograph, is used primarily for machine engraving of letters and designs on any materials, from enlarged templates or copy type, high speed profiling of small parts and the manufacture of small intricate dies, hobs and punches. In addition to working on flat surfaces, these machines, through the use of forming guides, can operate on concave, convex and spherical surfaces of uniform curvature within a circle 3½" to 4" in diameter. With routing attachments, the machines may be used as routers on high speed vertical millers. The Gorton 3-dimensional Pantograph, in addition to all work that can be done on the 2-dimensional machine, is ideally suited to reproduce die or molds of any shape or contour in three dimensions.

The catalog gives complete information on specifications, standard and special equipment, construction, operation and shipping data.

For a copy of "Pantograph Engraving Machines" (form 1580) write George Gorton Machine Co., Racine, Wis.

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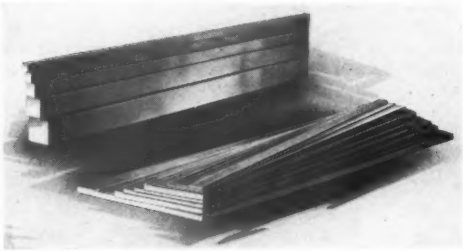

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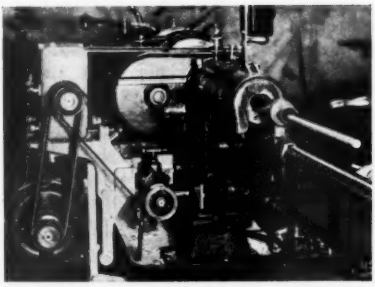
Drive-All Offers New Method for Mounting Motorizing Unit

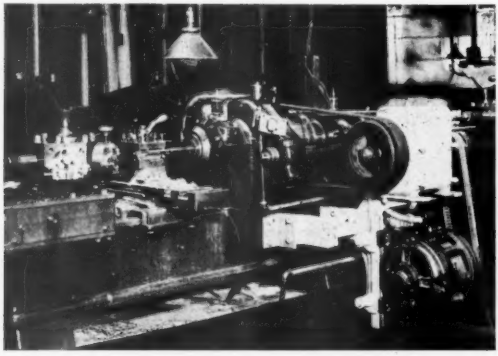
THE Drive-All Manufacturing Company, Detroit, Michigan, has developed a new method for mounting the DRIVE-ALL Motorizing Unit on hand screw machines, lathes, and similar equipment. Previously it has been customary to use a large main supporting bracket extending from the bed of the machine to a point above the pulley to be driven. This method of mounting has certain advantages and will continue to be offered as optional equipment, but the new rear mounting, similar to that shown in the photographs, offers an entirely new appearance in motorizing equipment.

There are no projecting parts above the machine to obstruct vision, and when belts and cone pulley are guarded the machine presents the appearance of a new, factory-built, motor-driven machine. Adjustment is provided for all belts and an extra pulley can be added to the imput side of the gear box to drive the coolant pump. The handle for shifting from one speed to another is conveniently located on front of the machine by means of an extension shaft.



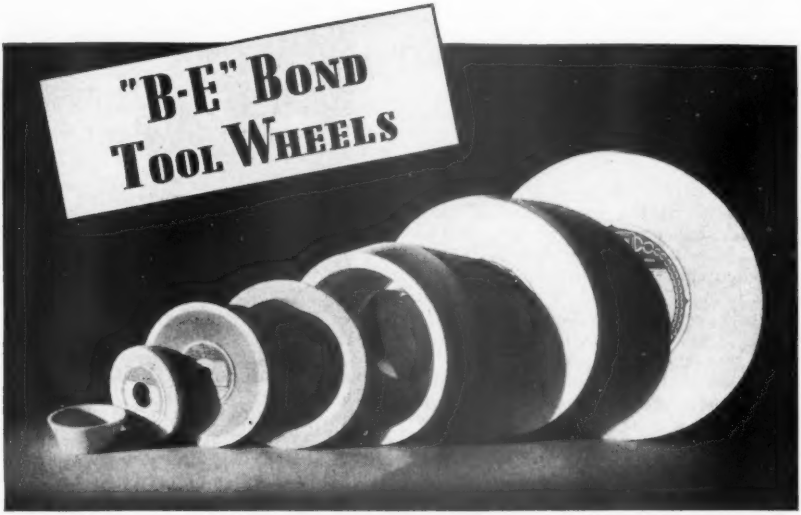
Note convenience of driving coolant pump; also extension shaft for gear box control handle mounted on front of machine.

DRIVE-ALL Units are in use in some of the leading industrial plants throughout the country. The Company has letters from many shops and departments of metal working plants stating that the DRIVE-ALL Units have increased the production of machines on which they are mounted; presenting evidence that the units are self-liquidating within a few months, thus increasing the profits for the user.



Rear view of machines; note how easily all belts can be adjusted.

For further information on the new method of mounting the DRIVE-ALL Motorizing Unit, write the Drive-All Manufacturing Company, 3401 Conner Ave., Detroit, Mich.



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HERE is a wheel that is setting a new record for tool room wheel performance. Users of Norton "B-E" bond wheels report that they are able to get extra production and longer wheel life without sacrifice of cutting speed and without the danger of burning the most heat-sensitive tool steels.

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New South Bend 10" Tool Room Bench Lathe Has 1" Collet Capacity

THE new 10" Swing 1" Collet Capacity series "S" Tool Room Bench Lathe recently announced by the South Bend Lathe Works, is a highly efficient tool for precision operation on small work. Mounted on an extremely sturdy welded tubular steel bench, this lathe which is made in 3', 3½', 4' and 4½' bed lengths, providing center distances of 16⅜", 21⅜", 27⅜" and 34⅜" respectively, has the rigidity and stability of a floor type lathe, combined with the speed, convenience and space-saving advantages of a bench lathe. To simplify the use of the lathe and to prevent operator fatigue, the hand wheels have been made large in diameter, the graduations are clear-cut and easy to read, and the controls have been conveniently arranged.

Smooth vibration-free operation at high spindle speeds is achieved by using a direct belt drive to the carefully balanced cone pulley and spindle assembly. The motor and driving mechanism are mounted under the headstock in the left end of the bench. Back-gears provide slow spindle speeds and ample power for machining large diameters. The headstock has 1⅜" capacity through the spindle and can be equipped with either hand lever type or hand wheel type draw-in collet chuck, taking collets up to 1" capacity. Twelve spindle speeds ranging from 50 to 1357 rpm are provided by standard motor drive equipment.

The spindle is made of a special grade of alloy steel, with all bearing surfaces, including the tapered hole, carburized, hardened and precision ground. The spindle nose has a precision screw thread (2¼"-8) and ground shoulder for perfect interchangeability of chucks and face plates. The integral type bearings for the headstock spindle are unusually large, and provide extreme rigidity.

The lathe bed is a heavy, semi-steel casting with three large V-ways and one flat way to guide and align the headstock, carriage and tailstock. The carriage is heavily constructed with long bearing surfaces on the bed ways. Power carriage feeds are operated by a worm drive and a series of precision cut steel gears in the one-piece double wall type apron which run in a bath of oil. The power feeds are controlled by an instantly engaging and disengaging multiple disc friction clutch which is so constructed that it will not stick or slip under heavy cuts.

The carriage is equipped with a graduated compound rest which may be swiveled to any angle and locked for turning or boring bevels and tapers. The compound rest top and compound rest base dovetails are hand-scraped and lapped and are fitted with adjustable tapered gibs. The tool post is made of heat-treated drop forged steel and has rocker adjustment.

The telescopic taper attachment, standard equipment on this lathe, makes it possible to change quickly from straight to taper turning or boring without disengaging the cross feed nut. The cross feed screw may be used to adjust the position of the cutting tool when turning tapers, the same as for straight turning. The taper attachment is permanently mounted on the lathe carriage and is always ready for use in any position along the length of the lathe bed.

Tool room attachments supplied with the lathe include hand wheel type draw-in collet chuck, telescopic taper attachment, micrometer carriage stop and

(Continued on Next Page)

Drill Jig Bushing Manufacturer Specializes in Precision Parts to Order

AMONG the small items in daily use in tool rooms and die shops are drill jig bushings. A notable example of a drill jig bushing and dowel pin manufacturer who has flourished and grown in this "peanut business" is the Acme Industrial Company of Chicago.

This firm carries in stock not only the complete A.S.A. standard, but its own standard, which had been popularized before the American Standards Association had considered jig bushings.

Experience in precision manufacture of drill jig bushings led to another development — the building of precision parts to order. The Acme Company has specialized in hardened and ground parts and cylindrical lapping. More recently, the company has investigated flat lapping and has developed equipment for production lapping of parts to within five millionths of an inch from absolute flatness. This accuracy can better be appreciated by remembering that five millionths (.000005") of an inch is to one inch as five-sixteenths ($\frac{5}{16}$") of an inch is to one mile, or 600 times finer than the average thickness of a human hair.

Such extremely flat surfaces find application for seals in the refrigeration industry and other places where a tight seal with a minimum of friction is required. Seals made by running together two flat surfaces of different materials have been found to have these characteristics together with long life without attention.

New South Bend Lathe

(Continued from Page 26)

thread dial indicator. Other attachments, and tools are supplied to order.

For complete information on the new 10" Tool Room Bench Lathe call your South Bend dealer or write South Bend Lathe Works, 198 E. Madison St., South Bend, Ind.

You wouldn't have a lathe with only a face plate

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Grob Announces New Improved 18" Throat Metal Band Saw

TO FILL the ever increasing demand for a good all around metal band saw, Grob Brothers, Grafton, Wisconsin, have developed and are now building what is called their Model NS-18 Band Saw.

Designed with a large throat of 18" and distance from table to upper column of 12", the new machine will cut extra heavy jobs with ease and speed using saw blades up to 1" wide. The NS-18 Band Saw is not too large to handle the smallest, most intricate jobs with blades as small as $\frac{1}{8}$" x .025".

The machine column consists of a one piece welded steel frame, reinforced to insure rigidity. A cast iron table of box section construction and heavily ribbed, 24" x 24" in size, is tiltable four ways. Besides being clamped in the conventional manner, it is locked with a table stabilizer which makes the table so rigid that the heaviest job cannot budge it. A 1 HP motor is used in connection with a silent, practically frictionless "V" belt drive. All pulleys are mounted on ball bearings. Ten speeds

(Continued on Next Page)

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New Grob Improved 18" Throat Metal Band Saw

(Continued from Page 28)

from 50 to over 2000 feet per minute, are provided.

Both upper and lower saw guides are adjustable in height. The lower saw guide can be brought flush with the table surface or above the table surface for special jobs. For cutting sheet metal it is adjusted to slightly above the table surface which eliminates shattering and possible breakage of saw teeth. Both upper and lower saw guide holders are locked into position by a new improved single lever quick acting clamp.

A Grob Butt Welder with built-in tool grinder is mounted into the frame in the most convenient position for the operator to join saw blades for internal cutting. A built-in drawer and cabinet make it easy to store tools, saw blades, etc., and keep the machine clean and efficient at all times. Swinging doors provide quick access to change saw blades.

A chart for the selection of saw blades as to width, number of teeth and speeds is mounted onto the machine. This permits the operator to immediately select the proper saw blade. Saw band tension wheel and indicator are on the upper right of the machine in convenient reach of the operator.

Because an efficient, all-around metal band saw is recognized in the general shop as well as the Tool Room as a machine tool as indispensable as a drill press or a lathe, Grob Brothers have tooled up for mass production of this machine, which, in spite of many improved features in design and construction, is offered to the trade at an unusually low cost.

Optional features of this machine include: automatic hydraulic checked table feed, light attachment, air blower, circular cutting attachment, magnifying glass and tachometer.

For full information on the new Grob NS-18 Band Saw or the name of your nearest Grob dealer, write Grob Brothers, Grafton, Wisconsin.

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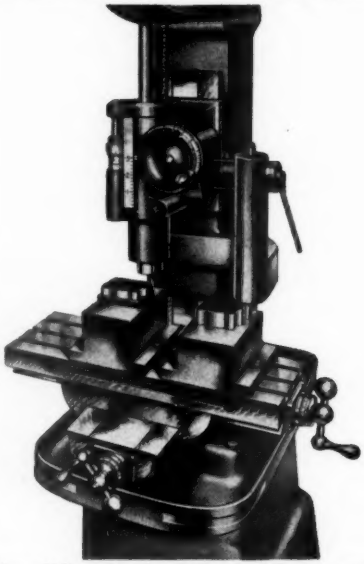
New Profiling Attachment Added to Vernon Line

FOR duplication of work in metal, plastics, patterns and dies, a novel profiling attachment has been developed by Machinery Manufacturing Company of Los Angeles for use on the Vernon Combination Vertical Mill and Jig Borer.



The sliding head of the tool is so constructed that this attachment can be easily and quickly engaged and disengaged. The attachment has been developed especially for small lot machining of irregularly shaped forgings, but it is also applicable to contour milling from wood, plaster or plastic models. It provides easy operation and gives an inexpensive attachment for duplicating from patterns for a wide variety of mold and die work within its range.

Specifications regarding the profiling attachment and the mill upon which it operates can be obtained from Machinery Manufacturing Company, P. O. Box 155, Vernon Branch, Los Angeles, Calif.

According to the New York TIMES only 5000 tool and die makers or less than 3 per cent of the estimated total of 200,000 are unemployed.

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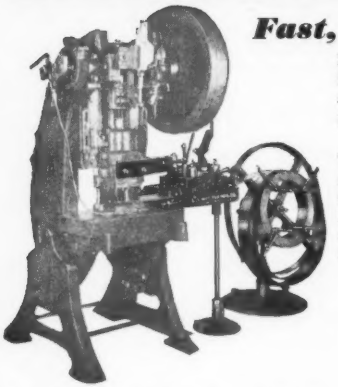

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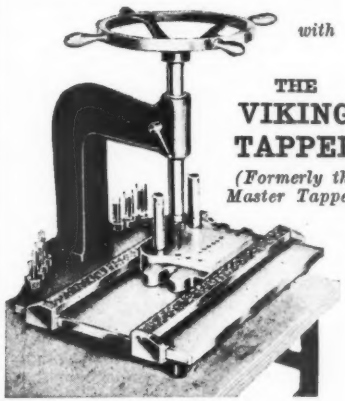

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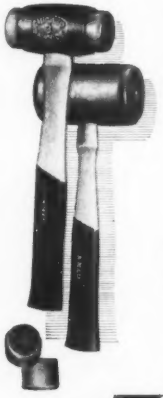

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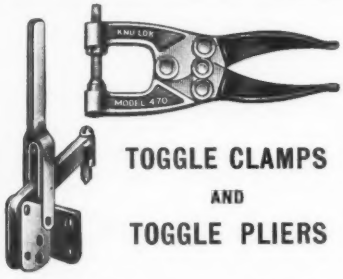

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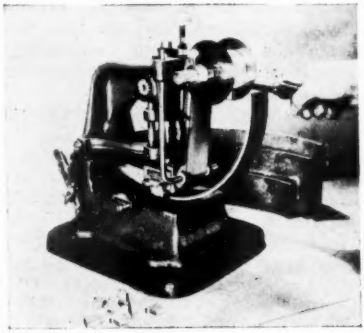
KNU-VISE
INCORPORATED
16841 Hamilton Ave., Highland Park, Mich.

H. O. Bates Introduces New Adjustable Stamping Machine

THE H. O. Bates Company announces a new Gold Stamping Machine that is adaptable to numerous numbering and marking jobs requiring a mark in color. Practically any color can be stamped on such materials as fibre, wood, leather, celluloid, bakelite and paper. The adjustable Gold Stamping Machine is exceptionally satisfactory for marking compressed materials.



The machine shown was made for stamping a number and code information in gold on molded brake-block. The machine will take a piece or part up to ¾" in thickness but with the new adjustable construction, products up to 4" in thickness can be stamped. It is furnished complete with heat control and six foot cord with plug for regular light socket. Fixtures and adjustments for handling almost any type of product can be made on special order. Machine is furnished with either dies, interchangeable type, or numbering head with quick change holder.

The production with hand operation can be as high as twenty-five pieces or more per minute depending upon the operator and the material. The price is low as parts for various special jobs have already been made.

Complete information on the new adjustable Gold Stamping Machine will be gladly given on request. Address H. O. Bates, 257-261 N. Broad St., Elizabeth, N. J.

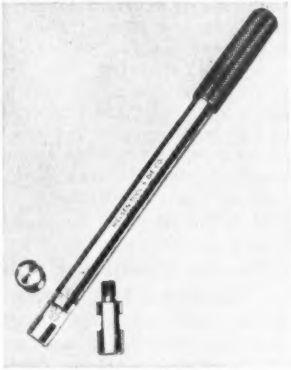
Consult the "Buy with Confidence" Directory, Page 31 and following, before you buy.

When you order or write about products described in TDM PROGRESS please mention the publication.

Neilsen Adds Layout Punches

A NEW method for transferring screw and stud holes from a drilled surface to another that is to be drilled in duplicate has been perfected in the Nielsen Layout Punches, now available. Layout punches are made to transfer drill holes through a drilled section in diameters from $\frac{17}{64}$" to $\frac{33}{64}$".

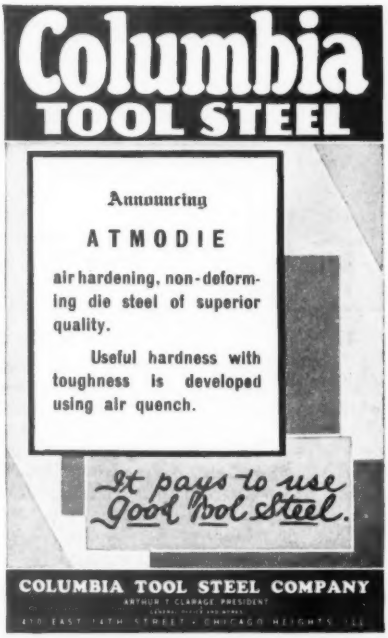
This method is an extension of the procedure used in transferring blind screw and stud holes through the use of Nielsen Transfer Screws. The procedure is to insert the punch *through* the drill holes to be duplicated. When a solid blow is struck on the punch head the drill center and drill circle will transfer with complete accuracy.



The punch is made with a case hardened tip, removable, as illustrated. Many economies are claimed for the Nielsen Layout Punches — availibility for either new or old work; layout marks cannot be lost because of drill or drilling fluids erasing a layout made with dividers; work is done rapidly and inexpensively.

Center and drill circle penetrate steel to a depth of .010". Transfer screws are made with a shoulder support of uniform height enabling holes of various sizes to be transferred in the same plane at one impression. The savings claimed are said to amount to 80% of the cost of transferring holes by older methods of operation.

For a new illustrated circular of Nielsen Layout Punches and Transfer Screws, write Nielsen Tool & Die Co., Berkley, Mich.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air hardening, non-deforming die steel of superior quality.
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It pays to use Good Tool Steel.
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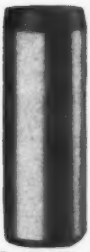

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Dumore Tap and Drill Chart

A HANDY Tap and Drill Chart that saves time and eliminates guess work, has been issued by The Dumore Company. Printed on durable stock and convenient for tacking up in shops, drafting rooms and engineering departments, the Dumore Tap and Drill Chart has in addition to Tap and Drill Tables, listings of standard U. S. and SAE Standard Screws, decimal equivalents and wire gauges in approximate decimals of an inch. The Dumore Company will furnish Tap and Drill Charts in limited quantities to shops on request.

For copies of The Dumore Tap and Drill Chart, write The Dumore Company, Dept. 370-G, Racine, Wis.

Forced feed lubrication plus hardened and ground shafts running in bronze bushings combine to minimize wear in the ILLINOIS Die Filing Machine. Shop men using it daily know that an ILLINOIS stands up longer . . . yet continues to produce highly accurate filing, sawing and stoning work. Write for descriptive literature today.

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Knu-Vise Takes Larger Quarters

FRANK L. McKENNA, sales manager of Knu-Vise, Incorporated, manufacturers of rapid action toggle clamps, toggle pliers and other holding devices states that new larger quarters have been taken at 16841 Hamilton Ave., Highland Park, Michigan. The ground floor houses a display room and the Detroit district stock; the offices, engineering and designing departments occupy the second floor. Clamps and other holding devices will continue to be manufactured at the Sturgis, Michigan plant.

Novelty Flashlight Bulb Useful for Die Shops

FOR the tool room and die shop man who finds need for a closely spotted light in hard-to-see places, the novel Sierra Flashlight Bulb Extension will be of particular interest. For instance, inspection of die parts during assembly or tryout, instrument readings, internal bores on a lathe or boring mill, inside of gear trains, and many other jobs which require close-up, and very accurate work is a very simple matter with this handy accessory.

The Sierra Flashlight Bulb Extension, made of special wire encased in a high-grade aluminum alloy tubing, is furnished in lengths from 6″ to 36″. The extension has a plug which will screw into any flashlight with a bulb in the opposite socket. Being bendable it can go down into intricate mechanisms, through a bushing or into a jig or fixture.

The Sierra Flashlight Bulb Extension is made by the Sierra Aircraft Company, Sierra Madre, Calif.

Methods for Accurate Locating of Work

(Continued from Page 19)

Another type of locator is T, Fig. 8. The block T is made of tool steel and hardened and ground. The Vee grooves locate the parallel with the base and the shoulder U locates the work lengthways. The grooves also locate the work sideways. A set screw holds the work against the shoulder U and usually a clamp operates from above the work to hold it down in the grooves. This is a very simple and inexpensive tool for the class of work for which it is usuable.

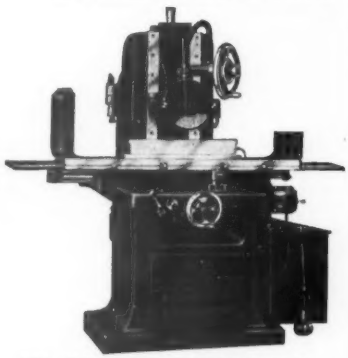
No. 1, Fig. 9, is a drawing of a locating pin that cannot be pulled out and lost. Its design is used chiefly for high production and high quality jigs. The pin is made of drill rod or tool steel and hardened and ground. One end is knurled for hand operation. The groove cut in the pin is for the point of the screw 4, which prevents its being pulled out. Should the working end of the pin be tight, this design allows the pin to be wrung in and out. The pin has a snug sliding fit in the hardened and ground bushing, 2, which has been press-fitted into the casting, 3. The bushing should be hardened and ground both internally and externally.

Scherr Becomes Distributor for Reed Micrometers

THE George Scherr Company, Inc., announces its appointment as national distributors for the complete line of Reed Micrometers, manufactured by the Reed Small Tool Works of Worcester, Mass. These micrometers have been manufactured continuously for over 30 years and include four distinct models in the 1" size and others from 2" to 6". The line also includes seven models of inside micrometers with various measuring capacities and two types of micrometer depth gages. A new circular illustrating, describing and pricing both individual micrometers and sets is available for distribution. The George Scherr Company maintains complete stocks of Reed Micrometers at its New York address.

For a copy of "Reed Micrometers" circular write the George Scherr Co., Inc., 128-B Lafayette St., New York, N. Y.

Speed and
Precision *Combined*



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They save time in setting up cutters on milling machines and other tools. Will help you get work out quicker. Low in cost, but high in savings. Standard stock sizes from .001" to .125" thick. Also specials up to 4.000".

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Kearney & Trecker Corp. Issues New Booklet

"CLIMAXING 42 Years," a booklet just issued by Kearney & Trecker Corporation gives graphic highlights on the development of this organization and the Milwaukee Milling Machines built by them. A chronicle of Progress lists the innovations made in milling equipment by this company. A large number of views of "the largest plant in the world devoted exclusively to the building of milling machines" includes manufacturing, testing, inspection, engineering and designing departments. A center 2-page chart of the "flow" of production in the big plant will be of particular interest to engineers. Candid camera "shots" of the personnel and management add a personal touch for those who do business with Kearney & Trecker. A list of representatives of the Corporation also adds value to the new booklet.

For a copy of "Climaxing 42 Years" write Kearney & Trecker Corporation, Milwaukee, Wis.

Continental Issues New DoAll Scrapbook

OVER 50 jobs done on the DoAll are listed in the new Scrapbook just issued by Continental Machines, Inc. Attractively bound in a booklet cover, the jobs are pictured and the work done by the DoAll is described on individual sheets. The types of jobs included are wide enough for the Scrapbook to be of real interest to tool room and die shop men, particularly those who are alert to every idea that can be used to save time. Each job gives the material, former time and DoAll time.

Copies of the DoAll Scrapbook will be sent on requests made to Continental Machines, Inc., 1303 S. Washington Ave., Minneapolis, Minn.

"Over 75 Years Experience"

REED-PRENTICE Corporation of Worcester, Massachusetts, has issued a booklet, "Over 75 Years Experience", which contains a brief historical note on the company and its antecedent companies, the F. E. Reed Company and the Prentice Bros. Company, views of various departments of the company and of leading products manufactured by them. Reed-Prentice offers a modern line of machine tools including: engine, toolroom and production lathes; vertical milling, die sinking and jig boring machines; die casting machines for zinc, tin and lead base alloys, brass, aluminum and magnesium; and plastic injection molding machines.

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Norton Technical Services

THE Norton Company has issued two new circulars, "Consulting Engineering" and "Research", which describe briefly these two services offered by this company. "Consulting Engineering" gives graphically a cross section of the actual grinding problems solved by Norton through 1800 representative consultants of Norton distributors who work out of 150 cities and a field staff operating from over 25 industrial centers. "Research" is a survey of the work done in the Norton Laboratories in which continual studies and tests for product improvement and product application are carried on.

For copies of "Consulting Engineering" and "Research", write the Norton Company, Worcester, Mass.

Simonds Flat Ground Stock Booklet Issued

The Simonds Saw and Steel Company of Fitchburg, Mass., has issued a pamphlet, "Your Passbook to Savings", which illustrates and describes how representative jobs of die parts, jigs, gages, fixtures and machine parts can be quickly cut from Simonds Flat Ground Stock. This stock is made from uniformly annealed high carbon tool steel produced in Simond's own steel mills. Hours of machining time can be saved, any flat part can be cut from the correct thickness with bandsaw, circle-cutting saw, trepanning tool or a die making machine. A minimum of edge finishing is all that is necessary to complete the part. Full specifications and prices are given.

For a copy of "Your Passbook to Savings", write the Simonds Saw and Steel Co., Fitchburg, Mass.

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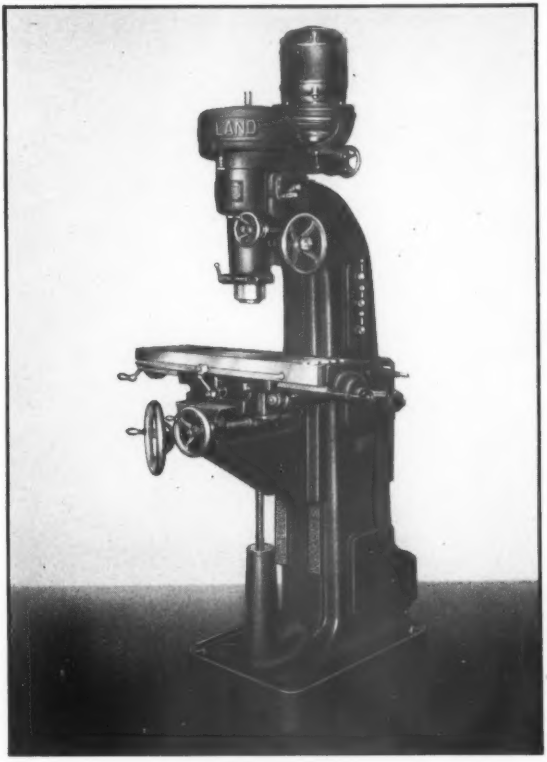

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